

**Microfluidic Devices and Methods with Electrochemically  
Actuated Sample Processing**

**ABSTRACT OF THE DISCLOSURE**

Electrochemical actuation is adopted in an integrated microfluidic chip to transfer fluid for sample preparation, separation and detection. The electrochemical actuation is capable of producing high pressure for on-chip fluidic handling. Technologies and methods are also developed to use only electrical source to control on-chip fluid handling without any external fluidic support. Applications for the devices and methods include micro scale HPLC, ESI-MS, etc.

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